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Lee Experimental Forest
Buckingham County, Virginia*

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U.S. Department of Agriculture - Forest Service
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*Trees and Shrubs of the Lee Experimental Forest
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Paul P. Kormanik and Elbert L. Little, Jr.^{1/}

Woody plants of 88 species have been found growing naturally at Lee Experimental Forest, Buckingham County, in central Virginia. This annotated list will serve as an inventory and reference of the trees, shrubs, and woody vines of this permanent research area. With the inclusion of 5 additional species from nearby Willis Mountain, the list is representative also of Buckingham County. It contains county distribution records, though published State and county floras are lacking.

The Lee Experimental Forest, area 2,700 acres, is located in Buckingham County about 4 miles south of Buckingham Court House and near the geographical center of Virginia. From 1936 to 1938 the Resettlement Administration of the United States Government purchased the twenty tracts of submarginal land from the owners. The area was transferred to the Forest Service, United States Department of Agriculture, in 1940, and is under the Charlottesville Research Center of the Southeastern Forest Experiment Station. Descriptions of the Lee Experimental Forest and research projects there have been published by Gruschow (5, 6) and by Evans and Minckler (3).

This experimental forest is representative of the Piedmont region of central Virginia, being situated in the southwestern part of the Slate River drainage at an elevation of about 500 feet above sea level. The land is rolling and of low relief, well drained with springs and small streams. Horsepen Lake, about 17 acres in area, was formed across Horsepen Creek by an artificial dam 443 feet above sea level at the spillway. No rivers occur within the boundaries.

The soils on the Lee were derived primarily from fine grain schist and mixed acidic and basic rocks. The soils are classified as belonging to the Great soil group known as the red-yellow podzolic soils. Rock outcrops and rocky soils are absent.

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Climatological data at nearby localities have been compiled by the United States Weather Bureau. At Farmville, about 20 miles southeast, the average annual rainfall is 46.05 inches, the average annual temperature is 57.9° F., the average temperature for January is 40.0° F., and for July, 77.6° F. The period between freezing temperatures is nearly 6 months.

A history of the Lee Experimental Forest has been compiled by George F. Gruschow.^{2/} Buckingham County was established in 1761 by an act of the Virginia General Assembly. Most Royal Grants to the land in this area were dated from 1746 to 1769. The original forests were cleared and replaced by plantations, the main crops being tobacco, corn, and wheat. After the Civil War some land was abandoned because of lack of labor and extensive pine stands became established. From 1890 to 1918, lumbering was important here. Besides cultivation and lumbering, the land was affected also by frequent forest fires. During the depression in the early 1930's, some agricultural land was abandoned. At present, forest products, including lumber, pine pulpwood, and railroad crossties, are important in the economy of the area.

The major forest types of the Virginia Piedmont are represented here. Roughly half of the area is in pine forests or small pines and half is covered with hardwood forests, mostly upland oak. The pine forests may be distinguished as Virginia pine (Pinus virginiana) or shortleaf pine (P. echinata) or as shortleaf-Virginia pine. The oak forests are characterized by white oak (Quercus alba) with other species of oaks and hickories. Among these are chestnut oak (Q. prinus), scarlet oak (Q. coccinea), southern red oak (Q. falcata), black oak (Q. velutina), and pignut hickory (Carya glabra). There are also mixed or oak-pine forests. About one-tenth of the area was classed as bottomland hardwoods, characterized by yellow-poplar (Liriodendron tulipifera), red maple (Acer rubrum), white oak (Quercus alba), and black tupelo (Nyssa sylvatica). When acquired, the area was about one-sixth open land or land cultivated during the 1930's. These old fields have since reverted to Virginia pine.

Various forest research projects were conducted at the Lee Experimental Forest in the 1940's toward making the Piedmont forests more productive. Several publications resulting in part or in whole from this early work may be cited (1, 2, 7, 8, 10, 11, 12). After a few years of relative inactivity, additional research projects are now in progress. Among these are stand conversion studies, rehabilitation of hardwoods, and soil site studies correlating tree growth with soil properties.

The herbarium specimens upon which this list is based were collected in 1951, 1959, and 1961. On June 28-29, 1951, Elbert L. Little, Jr., and George P. Jarrett collected specimens of the trees and large shrubs. On October 7-8, 1959, and August 21-23, 1961, Little and Paul P. Kormanik, with the assistance of J. F. Love, Jr., made additional collections of woody plants, mostly shrubs and woody vines. Identifications were made by Little.

^{2/} Gruschow, George F. History of Lee Experimental Forest. 17 pp. 1942. (Typed manuscript.)

Duplicate sets of about 150 specimens have been deposited in the Forest Service Herbarium at Washington, D. C., Forest Service Charlottesville Research Center at Charlottesville, Va., Virginia Division of Forestry, Charlottesville, Va., and herbarium at Virginia Polytechnic Institute, Blacksburg, Va.

As the Lee Experimental Forest is representative of the large, relatively uniform Piedmont region of central Virginia, unusual distribution records or range extensions of woody plant species were not expected. The native species mostly have broad ranges in eastern United States or the southeastern states north at least to Virginia. Species characteristic of the Coastal Plain on the east or of the Appalachian Mountains on the west generally are absent. A few records may be mentioned, though many specimens may represent the first formal collections for Buckingham County.

Celtis laevigata Willd., a southeastern species, is rare near its northeastern limit here.

Pinus pungens Lamb. and Pinus strobus L., rare at one locality and apparently native, are mountain species infrequent in the Piedmont. Xanthorhiza simplicissima Marsh. is another species characteristic of the Mountain region.

A few tree genera widespread in eastern United States are absent or poorly represented. For example, no native species of Populus or Tilia were found. Only one species of Acer is recorded, and Ulmus is rare. Ostrya virginiana (L.) K. Koch, eastern hophornbeam, was not observed.

After about two centuries of settlement, very few introduced woody species have become established as naturalized. So classified are 2 tree species, Broussonetia papyrifera and Robinia pseudoacacia, 2 shrubs, Prunus angustifolia and Rosa multiflora, and 1 vine, Lonicera japonica.

The 88 species of woody plants of Lee Experimental Forest include 43 species of trees, 31 of shrubs, 13 of woody vines, and 1 epiphyte or partial parasite. Of these, 83 are native and 5 both introduced and naturalized. Eight others (7 tree species and 1 woody vine) are rare introductions not established. Willis Mountain contributes 5 additions and 1 rare introduction. Altogether, 102 species are listed from Buckingham County.

The 41 native tree species of Lee Experimental Forest belong to 29 genera. There are 8 species of oaks (Quercus), 4 of pines (Pinus), and 1 or 2 species each in the remaining genera. Prominent among the shrubs are Rhus with 4 species (1 a vine) and Vaccinium with 3. Characteristic woody vines are Vitis and Rubus with 3 species each and Smilax with 2.

A few additional native species of shrubs and woody vines may be sought here. Other records for Buckingham County might be found along the James River, which forms the northern boundary.

The annotated list follows, with the 5 additions from Willis Mountain at the end. The rare introduced species have been inserted in parentheses for record of their occurrence, as some may become established in time. Scientific and common names of trees follow the Forest Service Check List (9). Scientific names of shrubs and vines follow The New Britton and Brown Illustrated Flora of the Northeastern United States and Adjacent Canada (4). Size of trees is indicated as large (more than 70 feet tall), medium-sized (30 to 70 feet tall), and small (less than 30 feet tall). Large shrubs are more than 5 feet high, and small shrubs less, sometimes only 1 or 2 feet in height. Species distribution is stated by forest types as pine, oak-pine, oak, bottomland hardwood, roadsides and clearings, and general. Abundance is given as abundant, common, uncommon, or rare.

ANNOTATED LIST

Pinaceae, pine family

Juniperus virginiana L., eastern redcedar. Small tree, general, common. Only one of several plantations here has been successful.

Pinus echinata Mill., shortleaf pine. Large tree, pine and oak-pine types, abundant.

Pinus pungens Lamb., table-mountain pine. Medium-sized tree, pine type, rare at only one location.

Pinus strobus L., eastern white pine. Large tree, bottomland hardwoods, rare at only one locality. Several trees along small stream 1 mile northwest of headquarters, apparently native. One small plantation here has been successful.

(Pinus taeda L., loblolly pine. Introduced. One small tree observed in oak-pine forest. Growing also in plantations here.)

Pinus virginiana Mill., Virginia pine. Medium to large tree, pine and oak-pine types, abundant.

Liliaceae, lily family

Smilax glauca Walt., cat greenbrier. Woody vine, bottomland hardwoods, uncommon.

Smilax rotundifolia L., common greenbrier. Woody vine, general, common.

Salicaceae, willow family

(Populus alba L., white poplar. Introduced. Planted around an old homesite 1 mile north of headquarters and now spreading vegetatively with numerous sprouts from roots.)

Salix nigra Marsh., black willow. Small to medium-sized tree, bottomland hardwoods along streams, uncommon.

Salix sericea Marsh., silky willow. Large shrub, bottomland hardwoods along streams, uncommon.

Juglandaceae, walnut family

Carya glabra (Mill.) Sweet, pignut hickory (including C. ovalis (Wangenh.) Sarg., red hickory). Large tree, oak, oak-pine, and bottomland hardwood types, common. Bark sometimes shaggy.

(Carya illinoensis (Wangenh.) K. Koch, pecan. Large shrub surviving from plantation in isolated tract, 1 mile north of headquarters. Rare, one seen.)

Carya tomentosa Nutt., mockernut hickory. Large tree, oak and oak-pine types, uncommon.

Juglans nigra L., black walnut. Medium-sized tree, bottomland hardwoods, uncommon. One small plantation.

Betulaceae, birch family

Alnus serrulata (Ait.) Willd., hazel alder. Large shrub or small tree, bottomland hardwoods along streams, common.

Betula nigra L., river birch. Large tree, bottomland hardwoods along streams, uncommon.

Carpinus caroliniana Walt., American hornbeam. Small tree, bottomland hardwoods, uncommon.

Corylus americana Walt., American hazel. Large shrub, bottomland hardwoods, uncommon.

Fagaceae, beech family

Castanea pumila Mill., Allegheny chinkapin. Large shrub, oak and oak-pine types, uncommon.

Fagus grandifolia Ehrh., beech. Large tree, oak type on slopes to bottomland, uncommon.

Quercus alba L., white oak. Large tree, general, abundant. The hybrid between white and chestnut oaks, Quercus alba X prinus (Q. saulii Schneid.), is rare in the oak forest.)

Quercus coccinea Muenchh., scarlet oak. Large tree, general, abundant.

Quercus falcata Michx., southern red oak. Large tree, general, common.

Quercus marilandica Muenchh., blackjack oak. Medium-sized tree, oak and oak-pine types, uncommon.

Quercus prinus L., chestnut oak. Large tree, oak, oak-pine and bottomland hardwood types, abundant.

Quercus rubra L., northern red oak. Large tree, oak, oak-pine, and bottomland hardwood types, common.

Quercus stellata Wangenh., post oak. Large tree, oak and oak-pine types, uncommon.

Quercus velutina Lam., black oak. Large tree, oak, oak-pine, and bottomland hardwood types, common.

Ulmaceae, elm family

Celtis laevigata Willd., sugarberry. Medium-sized tree, oak-pine and bottomland hardwoods, uncommon. Near northeastern limit here.

Ulmus americana L., American elm. Medium-sized tree, bottomland hardwoods, rare.

(Ulmus rubra Mühl., slippery elm. Introduced (?). Large shrub in roadside thicket, rare. Seen at two places.)

Moraceae, mulberry family

Broussonetia papyrifera (L.) Vent., paper-mulberry. Introduced. Small tree, planted around old homesite, now established with many young trees, rare.

Morus rubra L., red mulberry. Small tree, bottomland hardwoods and roadside, uncommon.

Loranthaceae, mistletoe family

Phoradendron flavescens (Pursh) Nutt., American-mistletoe. Evergreen shrubby epiphyte and partial parasite on Quercus coccinea and Q. rubra, oak forest. Rare at one locality, south end of Steager tract, 2 miles south of headquarters.

Menispermaceae, moonseed family

Menispermum canadense L., moonseed. Woody vine creeping on dam at Horsepen Lake. Rare and possibly introduced.

Magnoliaceae, magnolia family

Liriodendron tulipifera L., yellow-poplar. Large tree, general except pine type, abundant.

Annonaceae, annona family

Asimina triloba (L.) Dunal, pawpaw. Large shrub or small tree, bottomland hardwoods, rare.

Lauraceae, laurel family

Lindera benzoin (L.) Blume, spicebush. Large shrub, bottomland hardwoods, common.

Sassafras albidum (Nutt.) Nees, sassafras. Large shrub or small tree, general, common.

Ranuncalaceae, crowfoot family

Xanthorhiza simplicissima Marsh., yellow-root. Small shrub, bottom-land hardwoods along stream border, rare. Seen only along Horsepen Creek, 3/4 mile and 2-1/2 miles south of headquarters.

Hamamelidaceae, witch-hazel family

Hamamelis virginiana L., witch-hazel. Large shrub, bottomland hardwoods, rare. Observed only in isolated tract, 1 mile north of headquarters.

Liquidambar styraciflua L., sweetgum. Medium-sized tree, bottomland hardwoods, rare.

Platanaceae, sycamore family

Platanus occidentalis L., American sycamore. Large tree, bottomland hardwoods along streams, uncommon.

Rosaceae, rose family

Amelanchier arborea (Michx. f.) Fern., downy serviceberry. Large shrub or small tree, oak and bottomland hardwood types, uncommon.

Crataegus iracunda Beadle, hawthorn. Small to large shrub, bottomland hardwoods, uncommon.

Crataegus uniflora Muenchh., one-flower hawthorn. Small shrub to 5 feet high, general, uncommon.

Prunus angustifolia Marsh., Chickasaw plum. Large shrub. Probably introduced and escaped from cultivation. Forming thickets along roadsides, rare.

Prunus serotina Ehrh., black cherry. Medium-sized tree, pine and bottom types and invading abandoned fields, common.

Rosa carolina L., Carolina rose. Small shrub, oak forest, rare.

Rosa multiflora Thunb., Japanese rose, multiflora rose. Introduced. Climbing shrub, old field with pines, rare and local at roadside.

Rubus allegheniensis Porter, Allegheny blackberry. Woody vine or shrub, open fields, clearings, young pine stands and plantations, common.

Rubus enslenii Tratt., southern dewberry. Low woody vine, pine forest and bottomland hardwoods, uncommon.

Rubus occidentalis L., black raspberry. Low woody vine, bottomland hardwoods, uncommon.

Leguminosae, legume family

Cercis canadensis L., eastern redbud. Small tree, general, common to abundant.

(Gleditsia triacanthos L., honeylocust. Introduced. Large shrub, rare, one plant observed at roadside.)

Robinia pseudoacacia L., black locust. Large shrub to large tree, general except on bottomlands, common. Planted around houses, escaped, and naturalized.

(Wisteria frutescens (L.) Poir., American wisteria. Woody vine persisting and spreading at old homesite, rare.)

Simaroubaceae, ailanthus family

(Ailanthus altissima (Mill.) Swingle, ailanthus. Introduced. Small tree at roadside, rare.)

Anacardiaceae, cashew family

Rhus copallina L., shining sumac. Large shrub, oak-pine and pine types and clearings, common.

Rhus glabra L., smooth sumac. Large shrub, oak-pine and pine types and clearings, common.

Rhus radicans L. (Toxicodendron radicans (L.) Kuntze), poison-ivy. Woody vine, general, abundant.

Rhus toxicodendron L. (Toxicodendron quercifolium (Michx.) Greene), poison-oak. Small shrub, openings in oak forest, uncommon.

Aquifoliaceae, holly family

Ilex opaca Ait., American holly. Small tree, oak-pine forest, rare.

Ilex verticillata (L.) A. Gray var. padifolia (Willd.) Torr. & Gray, common winterberry. Small to large shrub, bottomland hardwood and oak forests, uncommon.

Celastraceae, bittersweet family

Euonymus americanus L., brook euonymus. Large shrub, bottomland hardwoods, common.

Aceraceae, maple family

Acer rubrum L., red maple. Large tree, general, abundant.

Rhamnaceae, buckthorn family

Ceanothus americanus L., Jersey-tea ceanothus. Small shrub, pine forest, uncommon.

Vitaceae, grape family

Parthenocissus quinquefolia (L.) Planch., Virginia-creeper. Woody vine, oak-pine, pine and bottomland hardwood types, common.

Vitis aestivalis Michx., summer grape. Woody vine, pine, oak-pine, and oak types, common.

Vitis labrusca L., fox grape. Woody vine, uncommon in bottomland hardwoods.

Vitis vulpina L., frost grape. Woody vine, pine forest, clearings, and bottomland hardwoods, common.

Guttiferae, mangosteen family

Ascyrum hypericoides L., St.-Andrews-Cross. Small shrub, oak type, uncommon.

Araliaceae, ginseng family

Aralia spinosa L., devils-walkingstick. Large shrub, bottomland hardwoods, rare. Known from a single locality below dam of Horsepen Lake.

Cornaceae, dogwood family

Cornus amomum Mill., silky dogwood. Large shrub, bottomland hardwoods bordering streams, uncommon.

Cornus florida L., flowering dogwood. Large shrub or small tree, general, abundant.

Nyssa sylvatica Marsh., black tupelo or blackgum. Large tree, general, abundant.

Ericaceae, heath family

Gaylussacia baccata (Wangenh.) K. Koch, black huckleberry. Small shrub, oak-pine and oak types, common.

Kalmia latifolia L., mountain-laurel. Large shrub, pine, oak, and bottomland hardwood forests, uncommon.

Lyonia ligustrina (L.) DC., he-huckleberry. Small shrub, oak-pine and oak forests, uncommon.

Oxydendrum arboreum (L.) DC., sourwood. Small tree, pine and oak-pine types, common.

Rhododendron nudiflorum (L.) Torr., pinxterbloom azalea ("wild-honeysuckle"). Large shrub, pine, oak, and bottomland hardwood types, common.

Vaccinium atrococcum (A. Gray) Heller., downy blueberry. Large shrub, bottomland hardwoods along small streams, uncommon.

Vaccinium stamineum L. var. neglectum (Small) Deam (V. neglectum (Small) Fern.), southern deerberry. Small shrub, general on uplands, common.

Vaccinium vacillans Torr., blueberry. Small shrub, general on uplands, abundant.

Ebenaceae, ebony family

Diospyros virginiana L., common persimmon. Small tree, general, common.

Oleaceae, olive family

Chionanthus virginicus L., fringetree. Large shrub, bottomland hardwoods, uncommon.

Fraxinus americana L., white ash. Medium-sized tree, bottomland hardwoods, rare.

Fraxinus pennsylvanica Marsh., green ash. Small tree, bottomland hardwoods, rare.

Bignoniaceae, bignonia family

Campsis radicans (L.) Seem., trumpet creeper. Woody vine, creeping on dam at Horsepen Lake, rare.

(Paulownia tomentosa (Thunb.) Steud. Introduced. Small tree around homesites, rare and local.)

Rubiaceae, madder family

Cephaelanthus occidentalis L., buttonbush. Large shrub, border of Horsepen Lake, uncommon.

Caprifoliaceae, honeysuckle family

Lonicera japonica Thunb., Japanese honeysuckle. Introduced. Woody vine, general, abundant. Destroying other vegetation and invading plantations.

Sambucus canadensis L., American elder. Large shrub, bottomland hardwoods, uncommon.

Viburnum acerifolium L., maple leaf viburnum. Small to large shrub, general, common.

Viburnum prunifolium L., blackhaw. Large shrub or small tree, pine and bottomland hardwood forests, uncommon.

ADDITIONS FROM WILLIS MOUNTAIN

Willis Mountain, located about 10 miles southeast of Buckingham Court House and a shorter distance southeast of the Lee Experimental Forest, rises several hundred feet above the Piedmont as an isolated mountain about 25 miles east of the Mountain region of western Virginia. Its axis is a cliff composed mostly of quartz with rocky slopes below. Having higher elevation and rock outcrops, it provides additional habitats, where woody species characteristic of the Mountain region may be sought. The rocky summit is being slowly removed by an open mining operation. A mill on the slope extracts the mineral kyanite, an aluminum silicate used in the manufacture of porcelain, and also produces white sand as a by-product.

An oak forest, in which chestnut oak (Quercus prinus) is the most common of the various hardwood species, occupies the rocky slopes of Willis Mountain. Most woody species are the same as on the adjacent Piedmont at Lee Experimental Forest, except that some bottomland hardwood species are absent. The 5 additions for Buckingham County not found on the Lee Experimental Forest are mentioned below. The first, second, and last are characteristic mountain species, though sometimes found eastward.

Pinus rigida Mill., pitch pine. One tree 50 feet high and 1 foot d.b.h., with needles long for this species, was found associated with shortleaf pine (P. echinata) and Virginia pine (P. virginiana).

Castanea dentata (Marsh.) Borkh., American chestnut. Common near mountain top as fruiting sprouts to 25 feet high from trees killed by chestnut blight.

Aronia arbutifolia (L.) Ell., red chokeberry. Small shrub, only 1 seen.

Malus angustifolia (Ait.) Michx. (?), southern crab apple (?). Large shrub, sterile, only 1 seen.

(Prunus cerasus L. (?), sour cherry (?). Introduced. Large shrub, sterile, only 1 seen.)

Epigaea repens L., trailing-arbutus. Creeping low shrub, uncommon on rock outcrops.

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